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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of the Petition of DIRECTV ENTERPRISES, INC. To Amend Parts 2, 25 and 100 of the Commission's Rules to Allocate Spectrum for the Fixed-Satellite Service and the Broadcasting-Satellite Service	RM No. 9118

JOINT OPPOSITION TO PETITION FOR RULEMAKING OF DIRECTV ENTERPRISES, INC.

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Digital Services Corporation ("DSC"), Microwave Services, Inc. ("MSI") and Teligent, L.L.C. ("Teligent," formerly Associated Communications, L.L.C.), by their attorneys, hereby jointly oppose the above-captioned Petition for Rulemaking ("Petition") filed by DIRECTV Enterprises, Inc. ("DIRECTV"). DIRECTV's Petition requests that the Commission (1) allocate the 24.75-25.25 GHz ("24 GHz") band currently allocated domestically to the Digital Electronic Message Service ("DEMS") and internationally (in Regions 2 and 3) to the Fixed Satellite Service ("FSS") (earth-to-space) for "feeder links" in the Broadcast Satellite Service ("BSS"), (2) allocate the 17.3-17.8 GHz band for BSS space-to-earth downlinks, and (3) adopt 4.5 degree orbital spacing for the use of these bands in providing BSS service.

I. INTRODUCTION AND SUMMARY

DSC, MSI and Teligent are licensees and applicants in the Digital Electronic

Message Service ("DEMS") that the Commission recently relocated from the 18 GHz band to the 24.25-24.45 and 25.05-25.25 GHz bands. DIRECTV's Petition proposes that the Commission allocate that latter 200 MHz of this spectrum (25.05-25.25 GHz) to BSS feeder links, which would create unacceptable interference to DEMS operations. Consequently, these DEMS operators will be directly affected by any Commission action in this proceeding.

DIRECTV's Petition is fatally flawed in several respects. First, DIRECTV fails to make the required *prima facie* showing that grant of its Petition is supported by sufficient evidence and would serve the public interest. DIRECTV's Petition is devoid of any supporting material for its generalized allegations regarding existing demand for additional BSS programming and spectrum or for its various technical proposals, including reverse band working in the 17 GHz band and co-channel sharing between BSS and various fixed terrestrial services. These threshold deficiencies alone warrant the dismissal of DIRECTV's Petition.

Additionally, DIRECTV's Petition is moot, given that the Commission's reallocation of DEMS to the 24.25-24.45 and 25.05-25.25 bands effectively precludes the Commission's grant of DIRECTV's Petition. As DIRECTV concedes, BSS service uplinks are not compatible with terrestrial DEMS systems nor certain public safety point-to-point microwave users. In fact, the high power required for BSS uplinks and the widespread deployment of DEMS and other fixed service microwave transmitters and user stations render DIRECTV's allocation of BSS to 24 GHz entirely unworkable. DIRECTV fails to demonstrate how it would mitigate these interference concerns. This too, in and of itself, warrants dismissal of the Petition.

DIRECTV's Petition also is premature, insofar as it urges the Commission now to adopt the international BSS allocation at 17.3-17.8 GHz that is not scheduled to come into effect until April 1, 2007. In 1992, the World Administrative Radio Conference ("WARC") specifically refrained from implementing the 24 GHz BSS allocation until the year 2007, and even then such allocation was limited only to HDTV BSS and not the more generic allocation proposed by DIRECTV. Moreover, in the 1992 WARC preparatory process the U.S. expressly rejected the proposal DIRECTV now makes and instead supported utilizing existing spectrum allocations to accommodate growing demand for BSS services. DIRECTV offers no compelling justification for ignoring or reversing these earlier public interest determinations.

DIRECTV's Petition also ignores or mischaracterizes several important technical issues. For example, DIRECTV is incorrect in arguing that "reverse band working" is "well-suited" for use in the 17 GHz band. To the contrary, reverse band working at 17 GHz would interfere with existing BSS operations in that band. DIRECTV fails to address this issue in its Petition. DIRECTV also fails to provide any analysis in support of its 4.5 degree orbital spacing proposal, thereby rendering this proposal untenable.

Finally, DIRECTV's claim of a BSS "spectrum shortage" is belied by the ability of BSS operators to implement a variety of techniques for spectrum optimization, such as frequency reuse and advanced modulation, that would yield additional capacity within the existing BSS allocation. In addition, to the extent that BSS reverse band working is feasible, BSS operators should implement it in the 12 GHz band before proposing to implement the technique in 24 GHz.

For these reasons, which are described more fully below, the Commission must dismiss the Petition.

II. DIRECTV'S PROPOSED ALLOCATION IS NOT JUSTIFIED AND WOULD NOT SERVE THE PUBLIC INTEREST

DIRECTV's Petition fails to satisfy several of the Commission's threshold criteria for rulemaking petitions and, as a result, it must be dismissed. The Commission will dismiss rulemaking petitions that are "moot, premature, repetitive, frivolous, or which plainly do not warrant consideration by the Commission."[1] The Commission's rules also require that petitions for rulemaking set forth "all facts, views, arguments and data deemed to support the action requested and shall indicate how the interests of petitioner will be affected."[2] Petitions that fail to "disclose[] sufficient reasons in support of the action requested"[3] or fail to "establish that the public interest would be served by the proposal" must be denied.[4] Courts have accorded the Commission wide latitude in applying these tests

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[1]See 47 C.F.R. § 1.401(e); see also Amendments to Parts 0, §0.281(b)(6), and Part 1, §§1.401 and 1.405(d), of the Commission's Rules, 79 FCC 2d 1, 4 (1980) (recognizing that some rulemaking petitions are "frivolous or patently lacking in merit, in that they request relief which it would clearly be impossible or impracticable to grant").

[2]47 C.F.R. § 1.401(c). Section 1.407 of the rules prescribes further that the FCC will issue a notice of proposed rulemaking only if it determines that a petition "discloses sufficient reasons in support of the action requested to justify the institution of a rulemaking proceeding." 47 C.F.R. § 1.407.

[3]47 C.F.R. § 1.407.

[4]See Petition to Reallocate VHF-TV Channel 9 from New York, New York, to a City Within the City Grade Contour of Station WOR-TV, 84 FCC 2d 280, 293 (1981)(Comm'r Washburn, dissenting); see also Amendment of Section 73.606(b), Table of Assignments, Television Broadcast Stations (Newark, N.J.), 49 FCC 2d 721, 722 (1974)(holding that petition based on "conjecture" and lack of substantive material" was properly dismissed).

and determining whether to grant rulemaking petitions.[5]

A. DIRECTV's Petition Fails to Make a *Prima Facie* Showing Consistent with the FCC's Threshold Rulemaking Standards

DIRECTV's Petition fails to support "all facts, views, arguments and data" with "sufficient reasons" to "support the action requested,"[6] and makes only a conclusory attempt to "establish that the public interest would be served by"[7] grant of its proposal. Indeed, as demonstrated below, the Petition is based on pure conjecture and is entirely bereft of any hard evidence to support its request for additional BSS spectrum. DIRECTV's Petition is simply an unsubstantiated "shot in the dark" attempt to warehouse BSS spectrum. The Petition's deficiencies, some of which involve technical matters that are discussed in more detail below, include:

- no studies of marketplace demand for additional BSS services;

See also Amendment of § 73.658(k) of the Commission's Rules to Bar Multiple Exposure of More Than One Episode of the Same Program (except for Local News or Public Affairs programs) in Access Time on Stations Owned by or Affiliated with a National Television Network in the 50 Largest Television Markets, 63 FCC 2d 500 (1977)(affirming denial of petition for rulemaking); Amendment of § 73.202(b), Table of Allotments, FM Broadcast Stations (Richmond, VA), 1 FCC Rcd 1048, 1049 (1986.

[5]The D.C. Circuit has found that "except in the rarest cases, the decision to institute rule making is one that is largely committed to agency discretion." WWHT, Inc. v. FCC, 656 F.2d 807, 815 (D.C. Cir. 1981); see also Cellnet Communications, Inc. v. FCC, 965 F.2d 1106, 1111 (D.C. Cir. 1992)("an agency's refusal to initiate a rulemaking is evaluated with a deference so broad as to make the process akin to non-reviewability")(citations omitted). Furthermore, the scope of judicial review of such agency decisions is "a narrow one, limited to ensuring that the [agency] has adequately explained the facts and policy concerns it relied on and to satisfy [the reviewing court] that those facts have some basis in the record." Id. at 1449 (citing Nat'l Resources Defense Council, Inc. v. SEC, 606 F.2d 1031, 1053 (D.C. Cir. 1979)).

[6]47 C.F.R. §§ 1.401(c); 1.407.

[7]47 C.F.R. § 1.407.

- no technical details about its proposed earth station receive terminals or feeder link stations;
- no operational details (*e.g.*, number of stations, location and siting needs) concerning its proposed feeder link stations;
- no calculation or assessment of the areas around 24 GHz feeder link stations where DEMS nodal receivers would suffer interference or how such interference would be eliminated;
- no analysis of why other frequency bands cannot be used for BSS, assuming an additional allocation is even necessary;
- no technical justification for a reduced orbital spacing in the 24 GHz band or why, if such spacing is feasible at 24 GHz, it is not also feasible in the current 12 GHz BSS band;
- no assessment of the effect of rain attenuation on reception at 17 GHz (for downlinks);
- no detailed assessment or interference analysis of the feasibility of reverse band working in the 17 GHz band;
- no calculation of the areas around 17.7-17.8 GHz point-to-point microwave transmitters where 17 GHz BSS receivers would suffer interference or how such interference would be eliminated; and
- no calculation of the areas around 17 GHz uplinks where 17 GHz BSS receivers would suffer interference under a reverse band working allocation or how such interference would be eliminated.

In addition, DIRECTV makes five broad, unsubstantiated assertions in support of its claim that BSS programming demands warrant the immediate allocation of its requested spectrum. First, it claims that additional BSS spectrum is required because the amount of available video programming is increasing "dramatically" each year.[8] DIRECTV, however, fails to substantiate this "dramatic" increase. It points to no abundance of programming that

[8]DIRECTV Petition at 3.

DBS cannot provide due to a spectrum shortage. Moreover, even assuming that such programming existed, DIRECTV fails to demonstrate any unmet demand for such programming on its or other DBS networks. DIRECTV offers no evidence to demonstrate that increased programming availability would translate into increased demand for BSS capacity, let alone support its assertion that such BSS programming actually is increasing or will continue to do so.[9] Since DIRECTV failed to address these fundamental issues, the Commission has no choice but to dismiss the Petition.

Second, DIRECTV similarly fails to support its contention that a trend toward higher technical quality demands more satellite spectrum capacity.[10] DIRECTV does not identify these advances in "technical quality" or how they will require more spectrum. Indeed, the contrary likely will be true: as compression technology becomes available, less spectrum will be needed.

Third, without any substantiation DIRECTV asserts that it needs more

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[9]A number of recently authorized Ka-band GSO FSS satellite systems propose to carry video programming and other direct-to-home services. These include Hughes (Application for Authority to Construct, Launch, and Operate a Ka-band Satellite System in the Fixed-Satellite Service and a Ku-band Broadcast Communications Satellite System, DA 97-971, rel. May 9, 1997 at ¶ 4)("Hughes Application for Spaceway System"); VisionStar (Application for Authority to Construct, Launch, and Operate a Ka-band Satellite System in the Fixed Satellite Service, DA 97-980, rel. May 9, 1997 at ¶ 3)("Application for Ka-band System"); PanAmSat (Application for Ka-band System, DA 97-978, rel. May 9, 1997 at ¶ 2); GE American Communications (Application for Ka-band System, DA 97-970, rel. May 9, 1997 at ¶ 3); and Orion Network Systems (Application for Ka-band System, DA 97-977, rel. May 9, 1997 at ¶ 3). PanAmSat is now owned by Hughes. Further, AlphaStar Television Network, a DBS service that operates on the Telstar 4 satellite, filed for Chapter 11 bankruptcy protection on May 22. Satellite Business News, July 2, 1997 at 1. This casts serious doubt on DIRECTV's underlying proposition that the American public has an insatiable unmet demand for additional satellite video programming.

[10]DIRECTV Petition at 3.

spectrum in order to tailor its programming offerings "to serve multiple demographic groups."[11] The unspecified targeting of programming to individual demographic groups, however, does not automatically increase spectrum demands, let alone constitute a showing of demand for the programming itself. For instance, even assuming a demand for additional BSS programming capacity, DIRECTV ignores the question of whether such demand could be satisfied through alternative means within the existing allocation, such as through time-shifting or channel sharing, or even through additional orbital slots in the existing BSS band.

Fourth, DIRECTV makes the specious claim that the need for additional BSS spectrum slots is also precipitated by increased demand for the digital services of business and educational users.[12] Contrary to this claim, such non-video applications can survive very well on a relatively low data rate of a few megabits per second and DIRECTV provides no evidence of the need for additional BSS satellite capacity to support such low data rates.[13] These applications can be better supported using GSO-FSS satellites, a factor that DIRECTV again does not address.[14]

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[11]Id.

[12]Id.

[13]The Commission has already licensed sufficient FSS capacity for such uses. See, e.g., Teledesic Corporation Application for Authority to Construct, Launch, and Operate a Low Earth Orbit Satellite System in the Domestic and International Fixed Satellite Service, DA 97-527 (rel. Mar. 14, 1997). Moreover, one of the benefits of the new MPEG-2 digital video compression technology that will be employed by broadcasters in the United States is that it will also provide substantial capacity for data distribution services within the 6 MHz broadcast channel. Standardization work is now underway by subcommittee T3S13 of the Advanced Television Systems Committee to develop standards for the distribution of both streaming data and carousel data services within MPEG transport streams.

[14]Notably, Hughes's recent application for its Spaceway system makes clear that it will provide digital services. See Hughes Application for Spaceway System.

Fifth, DIRECTV wrongfully claims that its request for additional BSS capacity is justified by spectrum demands imposed by "an entirely new programming category of Internet-like 'multimedia'."[15] Multimedia services, however, are delivered via the FSS[16] band, and not BSS. In fact, DIRECTV's affiliated Hughes DirecPC service, which delivers Internet data to home subscribers, operates on FSS satellite capacity on Galaxy 4, and not on BSS frequencies.[17]

DIRECTV has failed to submit the requisite technical and other supportive information to justify its proposed allocations. DIRECTV offers no studies or other empirical data to support its fundamental claim that demand for additional programming necessitates additional BSS spectrum. Moreover, as discussed in the subsequent sections, the proposed BSS allocation would cause unavoidable interference between BSS and terrestrial fixed services at 17 GHz and 24 GHz, and DIRECTV has not proffered any analysis to demonstrate the extent of this interference or how it would be mitigated. In light of the important national security considerations that resulted in the relocation of DEMS to 24 GHz, and in light of WARC's and the Commission's bases for *not* heretofore adopting DIRECTV's proposals, grant of DIRECTV's Petition would impose considerable expense, disruption and uncertainty on the Commission, DEMS licensees, 17 GHz microwave licensees, and

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[15]DIRECTV Petition at 4.

[16]International footnote 882G (now S5.542) provides that BSS feeder links have priority in the 24.75 to 25.25 FSS band over all other satellite uses. For purposes of this Joint Opposition, however, unless otherwise stated the term "FSS" refers fixed satellite services other than BSS feeder links.

[17]*AUDIO WEEK: DIRECTV*, Audio Week, May 12, 1997.

consumers.[18]

B. DIRECTV's Petition Is Moot With Respect to the Proposal to Allocate 24 GHz for BSS

DIRECTV requests that the Commission allocate the 24 GHz band for additional BSS "feeder links." The Commission, however, recently reallocated DEMS to the 24.25-24.45 and 25.05-25.25 GHz bands,[19] effectively precluding the Commission's grant of DIRECTV's Petition. The Commission relocated DEMS to these bands in direct response to a request by the National Telecommunications and Information Administration ("NTIA"), which in turn was acting on the behalf of the Department of Defense, to accommodate vital national security concerns.[20] This relocation of DEMS was "essential to fulfill requirements

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[18]DIRECTV's technically and substantively deficient Petition is similar in material respects to the 1992 petition for rulemaking submitted by K-Sat Broadcasting ("K-Sat"). In that petition, K-Sat requested that the Commission amend its spacing policy for C-Band satellites, which required two-degree spacing by the mid-1990s, to permit certain satellites to remain at three-degree spacing. See Amendment of C-Band Satellite Orbital Spacing Policies to Increase Satellite Video Service to the Home, 7 FCC Rcd 456 (1992). Without providing the Commission sufficient technical evidence supporting its claims, K-Sat's petition simply summarily listed several reasons why the public interest warranted grant of its request, such as the ability to use smaller receive dishes and the reduction in interference potential. The Commission rejected K-Sat's petition, reasoning that it "did not contain elaboration or supporting information" and because it "fail[ed] to demonstrate sufficient reasons to justify the consideration of" its proposals. Id. at 457. The Commission also found that grant of the K-Sat's requested rulemaking likely "would cause major costs, disruption and uncertainty in the satellite industry." Id.

[19]See Amendment of the Commission's Rules to Relocate the Digital Electronic Message Service from the 18 GHz Band to the 24 GHz Band and to Allocate the 24 GHz Band for Fixed Service, 12 FCC Rcd 3471 (1997) ("DEMS Relocation Order"). The complete DEMS reallocation was to the 24.25-24.45 and the 25.05-25.25 bands.

[20]Id. at 3472.

for Government space systems to perform satisfactorily."[21]

BSS service uplinks are not compatible with terrestrial DEMS systems, thus DIRECTV's proposal would undermine DEMS licensees' ability to provide facilities-based telecommunications services. DIRECTV acknowledges this incompatibility in its Petition, admitting that "[i]t is widely understood . . . that transmitting earth stations present a potential for interference into nearby terrestrial receive antennas."[22] DIRECTV also concedes that "there will be zones around a DIRECTV uplink station at 24.75-25.25 GHz where a DEMS antenna could receive unacceptable interference."[23] Citing the Commission's order in the 28 GHz proceeding, DIRECTV notes correctly that "[i]n a number of situations involving widely-deployed terrestrial receive antennas" such as those utilized for DEMS, the Commission "determined that significant interference problems would arise from the deployment of satellite transmit earth stations in the same band, and decided or proposed to preclude earth stations from operating in the same part of the band as the terrestrial service."[24] Given these admissions, DIRECTV's request for additional BSS orbital slots and frequencies overlapping the new DEMS band is untenable, particularly given DIRECTV's failure to conduct an interference analysis on the feasibility for DEMS and BSS services to

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[21]Id. at 3478, citing Letter from Richard Parlow, Associate Administrator, Office of Spectrum Management, NTIA, to Richard Smith, Chief, Office of Engineering and Technology, FCC, dated January 7, 1997.

[22]DIRECTV Petition at 11.

[23]Id.

[24]DIRECTV Petition at 11.

coexist in the same band.[25]

In fact, in light of the high power required for BSS uplinks[26] and the widespread deployment of DEMS transmitters and user stations, DIRECTV's proposed co-channel allocation of DEMS and BSS facilities would be entirely unworkable. The Commission concluded in the 28 GHz proceeding that such high-powered uplinks will cause unacceptable interference into terrestrial microwave receive antennas.[27] Several entities are currently authorized to operate and in fact are operating DEMS user station transmitters and DEMS nodal station receivers in the 24 GHz band.[28] Distance separations of 94 to 316 miles between 24 GHz feeder links and DEMS operations, given the information in

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[25]DIRECTV makes the incorrect claim that it was "unable to determine definitively the extent of the incompatibility between DEMS and BSS uplinks" because, among other things, there was no opportunity to comment before release of the DEMS Relocation Order. DIRECTV Petition at 11. To the contrary, technical information on existing DEMS systems required for such an interference study has long been available to the public in the Commission's public reference files. In any event, prior to filing its Petition, DIRECTV made no attempt to obtain from existing DEMS licensees any information necessary for its analysis.

[26]DIRECTV's Application for authority to construct a new satellite system at 17.3-17.8 GHz indicates that "[d]epending on the final business plans, a number of [earth stations] may be needed in different cities across the United States." Application of DIRECTV Enterprises, Inc. for Authority to Construct, Launch and Operate an Expansion System of Direct Broadcast Satellites, filed June 5, 1997, at 4 (hereinafter "DIRECTV Application").

[27]See Rulemaking to Amend Parts 1, 2, 21 and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, 11 FCC Rcd 19005, 19009 (1996).

[28]Contrary to DIRECTV's assertion that the DEMS relocation to 24 GHz "has not yet become effective" (Petition at 5), the relocation became effective on June 5, 1997. In three markets all future and existing DSC and MSI DEMS operations must be at 24 GHz.

DIRECTV's application, could be needed to protect against interference.[29] Thus, under DIRECTV's proposal the Commission would have to prohibit 24 GHz BSS feeder link sites within 300 miles of the boundaries of each DEMS licensed service area to accommodate nationwide DEMS availability.[30] Such expansive interference protection would render any BSS/DEMS band coexistence too impracticable and inefficient to be consistent with the public interest, irrespective of the number of BSS feeder links at 24 GHz.

C. DIRECTV's Petition Is Premature

As discussed above, the Commission's rules governing rulemaking petitions provide that the FCC may deny or dismiss without prejudice "premature" petitions for rulemaking.[31] DIRECTV's Petition is premature insofar as it urges the Commission now to adopt the international BSS allocation at 17.3-17.8 GHz (International Footnote S5.517) that is not scheduled to come into effect until April 1, 2007.[32] DIRECTV's Petition provides no justification for implementing this allocation 10 years early, and merely concludes that "no

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[29]See Exhibit 1. This calculation assumes earth station sizes of 9 meters and 13 meters in diameter, and an elevation angle between 20 degrees and 40 degrees. The use of "Type II" modulation with a higher power spectral density, as described on page 34 of DIRECTV's application filed simultaneously with its Petition, would cause interference at even larger distances.

[30]There is precedent for such restrictions in the limits on MSS feeder link stations at 29 GHz, where each station must be at least 75 nautical miles from the borders of the 100 largest MSAs. See 47 C.F.R. § 101.147(y). The separation distance could be decreased from 300 miles to 100 miles if BSS operators were to accept operational limits on feeder link stations, such as (1) antenna sizes of 13 meters or greater, (2) operation above nominal clear-air power levels only to the extent that it is necessary to compensate for rain impairment on the uplink, and (3) elevation angles of 40 degrees or greater. See Exhibit 1.

[31]See 47 C.F.R. § 1.401(e).

[32]DIRECTV Petition at 12.

good purpose would be served" by waiting until 2007 without addressing the reason for the deferment.[33]

First, DIRECTV misconstrues the WARC-92 17 GHz allocation. The 1992 WARC did not consider the allocation of additional spectrum for just any BSS use whatsoever, but instead limited its allocation to HDTV BSS only.[34] Thus, DIRECTV's Petition is inconsistent with the 1992 WARC allocation insofar as it proposes a BSS allocation for something other than HDTV BSS.

Second, DIRECTV's conclusory claim that "there does not appear to be any reason to constrain" use of the 17 GHz band prior to 2007[35] conveniently ignores the underlying justification for delaying until 2007 in the first place. WARC-92 decided that the 17.3-17.8 allocation for BSS HDTV downlinks should not go into effect earlier than 2007 in order to allow BSS to reach a sufficient state of maturity in the 12 GHz with a stable base of uplink sites in the 17 GHz band. DIRECTV has provided the Commission with no

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[33]DIRECTV Petition at 12. Unlike the 21.4-22.0 GHz allocation for BSS HDTV in Regions 1 and 3, for which there were interim procedures adopted for use of the band prior to the allocation date of 2007, WARC-92 specifically did not adopt any comparable provisions for early use of 17.3-17.8 GHz in Region 2. Consequently, WARC did not intend that 17.3-17.8 GHz be used at BSS in Region 2 until 2007, and DIRECTV fails to justify an earlier allocation. See Resolution COM 5/5. The source of this consideration was Resolution No. 521 (COM 5/3) of WARC ORB-88. Preparation for the International Telecommunication Union World Administrative Radio Conference, 5 FCC Rcd 6046, 6064 (1990) ("1992 WARC Second Notice of Inquiry"). See also WARC-92 Final Acts, Resolution COM 5/6.

[34]See Preparation for the International Telecommunication Union World Administrative Radio Conference, 6 FCC Rcd 3900, 3910 (1991) ("1992 WARC Report"); see also Final Acts of WARC-92, Resolution COM 5/6 ("this Conference has added an allocation to the BSS in the bands . . . 17.3-17.8 GHz in region 2 for use by wide RF-band HDTV").

[35]DIRECTV Petition at 12.

explanation or support for why the Commission should discard this rationale.

Third, the Commission's grant of DIRECTV's Petition would directly contradict the U.S position at WARC-92. The U.S. posited that there should be no new spectrum allocated to HDTV BSS at all, but instead that existing BSS allocations should be more efficiently utilized in order to accommodate additional demands posed by HDTV. The U.S. concluded that "the existing 12 GHz band [should] be the first choice for meeting this [HDTV BSS] requirement" and that a new, exclusive allocation for HDTV BSS at the 24.65-25.25 GHz band should be resorted to only as an "alternative choice."[36] The U.S. considered and rejected the 17.3-17.7 GHz band for BSS, specifically on the basis that it would be difficult for BSS receive stations to share the band with existing and future BSS feeder links that "may employ widespread use of mobile or transportable stations to cover news or sporting events."[37]

Finally, even if DIRECTV's Petition were seeking to accelerate the domestic allocation of 17 GHz specifically for HDTV BSS service -- which it is not -- the Commission would still be under no obligation to adopt the international designation. An international allocation does not assure that a country-specific allocation must be adopted in all or part of that band, in the U.S. or anywhere else within Region 2. Far from being a *fait acompli*, international spectrum allocations are subject to a full analysis by national

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[36] 1992 WARC Report at 3910.

[37] Id.

administrations before they are adopted as national allocations, if they are adopted at all.[38]

Moreover, as with any spectrum allocation issue, the Commission must determine whether effectuating or accelerating the international HDTV BSS allocation would serve the public interest. DIRECTV, therefore, bears a substantial burden to show that the public interest would be served by an allocation proposal that was previously considered and rejected by the U.S., that is contrary to the U.S. position at WARC-92 and inconsistent with the WARC-92's allocation to support HDTV BSS, and that adversely impacts operational and licensed systems in both the proposed uplink and downlink frequency bands. In light of DIRECTV's failure to provide supporting materials for its technical proposals and

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[38]The International Telecommunication Convention ("ITC"), which created the International Telecommunication Union and provided the foundation for the "WARC" conferences, permits signatory nations, like the United States, to enact "domestic provisions in cases where the physical characteristics of the radio spectrum and of the domestic uses permit operations within the stated interference constraints." See Amendment of Part 2 of the Commission's Rules Regarding Implementation of the Final Acts of the World Administrative Radio Conference, Geneva, 1979, 54 RR 1500, 1503 (1983). ITC signatory nations have the ability to adopt allocations that conflict with the International Table of Allocations through Radio Regulation No. 342:

> Administrations of the Members shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations given in this Chapter or the other provisions of these Regulations, except on the express condition that harmful interference shall not be caused to the services carried on by stations operating in accordance with the provisions of the Convention and of these Regulations.

See Amendment of Part 2 of the Commission's Rules Regarding Implementation of the Final Acts of the World Administrative Radio Conference, Geneva, 1979, (citing Radio Regulation No. 342), 54 RR 1500, 1503 (1983). There are numerous examples where a Commission allocation does not correspond to the international allocation for a particular frequency band, including the following: (1) 3600-3700 MHz (government relocation); (2) 2310-2360 MHz (BSS/WCS); (3) 902-928 MHz (government radiolocation and radionavigation); (4) 894-896 MHz (aeronautical mobile); and (5) 420-450 MHz (government radiolocation).

generalized allegations, it has utterly failed to satisfy this burden.

III. DIRECTV'S PETITION IGNORES OR MISCHARACTERIZES SEVERAL IMPORTANT TECHNICAL ISSUES

A. Contrary to DIRECTV's Bald Assertions, No Evidence Suggests That The Existing BSS Allotment Is Inadequate to Meet Existing BSS Demand

As discussed above, DIRECTV provides no support for its assertion that "there is an inadequate amount of spectrum available for the provision of BSS service."[39] To the contrary, the existing BSS band can accommodate additional BSS orbital slots without requiring the allocation of new spectrum.

In fact, if DIRECTV genuinely believed that there was a spectrum shortage, it should have proposed in the first instance that the Commission and a World Radio Communication Conference reexamine and update the Appendix 30/30A plan for the 12.2-12.7 GHz BSS band in Region 2 since this band can support additional BSS satellites at reduced orbital spacing. The existing BSS plan was adopted at the 1983 Regional Administrative Conference for the Planning of the Broadcasting-Satellite Service and contains the orbital locations and transponder assignments for use of the 12.2-12.7 GHz band by Region 2 countries. The plan is woefully outdated, having been based on the technical and political landscapes in place 15 years ago. In fact, the plan is so outdated that it is based on the delivery of analog FM video signals rather than digitally compressed MPEG video, which did not exist at the time the plan was developed.[40] Moreover, it is based on outdated satellite

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[39]DIRECTV Petition at 3.

[40]"Planning of the broadcasting-satellite service is based on the use of a frequency-modulated composite-coded colour television signal with two sound subcarriers." Final Acts of the 1983 RARC, Part 1, p. 56.

technology and earth station technology.[41]

The Commission's well-settled policy is to accommodate increased demand for satellite transponder capacity by maximizing the use of the orbit -- *i.e,* by minimizing orbital spacing -- rather than by allocating new spectrum.[42] Numerous technical advances in satellite design and signal coding since 1983 permit the use of such reduced orbital spacing. Orbital spacing reduction should not cause interference to existing BSS receive antennas, yet could potentially double the capacity within the existing BSS allocation. Thus, reduction of orbital spacing in the U.S. portion of the current BSS band to less than the current 9 degrees should be explored before the allocation of additional BSS spectrum is contemplated. Although such a change would require a modification to the Region 2 BSS Plan, the plan itself contains the procedures for making such changes.[43] Rather than proceed further with DIRECTV's instant request, both equity and technology force the conclusion that the Commission should, if indeed it is ever necessary to accommodate additional capacity for BSS, return to its initial position espoused at WARC-92 that the 12.2-12.7 GHz band is the best candidate for additional BSS capacity.

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[41]These include receiver noise temperature (id. at 60), satellite stationkeeping accuracy (id. at 63), and antenna pointing accuracy (id. at 67). On the other hand, one 1983 assumption that is still valid is the use of a receive antenna with a half-power beamwidth of 1.7 degrees. Id. at 60.

[42]See Licensing of Space Stations in the Domestic Fixed-Satellite Service and Related Revisions of Part 25 of the Rules and Regulations, 88 FCC 2d 318 (1981).

[43]See generally, Final Acts of the 1983 RARC, Part III. (Specific procedures for modification are found in Appendices 30 (12.2-12.7 GHz downlinks) and 30A (17.3-17.8 GHz feeder links). In addition, because the U.S. "full CONUS" portion of the BSS band, i.e., 101 degrees W.L. -- 119 degrees W.L. comprise 18 degrees of contiguous spectrum not affecting Canada and Mexico, reductions of spacing in this portion of the band would not impact any other Region 2 country.

B. Reverse Band Working at 17 GHz Would Interfere with Existing BSS Operations

DIRECTV wrongfully contends that "reverse band working" is "well-suited" for use in the 17.3-17.8 GHz band and would "maximize the efficient use of orbital spectrum resources."[44] Although reverse band working has long been considered practical for satellite services with a limited number of earth stations, such is not the case for BSS. In order to avoid interference in a reverse band working scenario, there must be sufficient physical separation between co-frequency transmitters and receivers. BSS, however, requires widespread deployment of end user receive dishes that are not individually licensed and are installed by the end users themselves. Thus, it would be difficult to achieve sufficient physical separation between the necessarily ubiquitous 17 GHz end user receive stations and 17 GHz feeder links. Consequently, reverse band working would limit or prevent the development of new BSS operations that need multiple 17 GHz feeder links within the same metropolitan areas where 17 GHz BSS subscriber receivers would be deployed.[45]

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[44]DIRECTV Petition at 13.

[45]It is for this reason that the U.S position at WARC-92 was not to allocate new spectrum to BSS. The U.S. indicated that the 17.3-17.7 GHz band would not be susceptible to sharing between BSS receivers and BSS feeder links that "may employ widespread use of mobile or transportable stations to cover news or sporting events." See 1992 WARC Report at 3910. Indeed, earlier this year there was a proposal to deliver a BSS service that would include local television stations covering 75% of the U.S. market. Satellite Business News, March 12, 1997 at 1. Unlike the existing BSS services that employ only one or two feeder link stations, this previously proposed service offering would have required numerous feeder link stations, located in the very same areas as the expected locations for new 17 GHz BSS receivers contemplated under DIRECTV's plan. The technical feasibility of such sharing would be doubtful, however, given that allocating the 17.3-17.8 GHz band as a new BSS downlink likely would limit the potential development of existing BSS services (i.e., 12 GHz) that might require large numbers of 17 GHz feeder link stations. Such a result clearly would be contrary to the public interest.

DIRECTV ignores these technical considerations in its Petition. Although DIRECTV admits that there will be areas where existing BSS feeder link stations will cause interference to new BSS receivers in the 17.3-17.8 GHz band,[46] it makes no showing of the size of the interference area around existing and planned 17.3-17.8 GHz feeder links nor what coordination requirements would be necessary between collocated 17 GHz feeder link stations and receivers. Absent evidence that such coordination is feasible, the grant of DIRECTV's proposal for reverse band working at 17 GHz would be inappropriate.

C. DIRECTV's Proposed Allocation is Incompatible with Existing Microwave Operations

Another flaw in DIRECTV's proposal to use the 17.3-17.8 GHz as a BSS downlink is the fact that the 17.7-17.8 GHz portion of that band is heavily populated by microwave licensees. Included in this band are portions of essential public safety networks operated by the State of California, the City of Los Angeles, and other government agencies.[47] These microwave networks must be presumed to cause interference into BSS receivers, since microwave operations in the 12.2-12.7 GHz band were found to be "likely to cause interference into the DBS home receiver."[48] In fact, after allocating the 12 GHz band

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[46]DIRECTV Petition at 8.

[47]See Spectrum Frequency Database, PerCom Corp., Bemus Point, NY. Other public safety microwave networks operate in this band in the State of Alaska; the City of Cleveland, OH; the City of Boulder, CO; the County of El Paso, CO; the State of Minnesota; and the State of Wisconsin, among others.

[48]Inquiry into the Development of Regulatory Policy in Regard to Direct Broadcast Satellites for the Period Following the 1983 Regional Administrative Radio Conference, 90 FCC 2d 676, 693 n.36 (1982), citing Hiroshi Akima, "Sharing of the Band 12.2-12.7 GHz Between the Broadcasting-Satellite and Fixed Services." (Boulder, Colorado: Institute for Telecommunications Sciences, January 1980).

(12.2 to 12.7 GHz) to DBS, the Commission noted that it would be necessary to reallocate 12 GHz fixed microwave users because "the fixed services and DBS services cannot use the same frequencies in a geographic area due to interference."[49] The Commission permitted these microwave users to relocate to several alternate bands, including 17.7-19.7 GHz,[50] which encompasses the 17.7 to 17.8 GHz portion of the 17 GHz band at issue in DIRECTV's Petition.

As shown in Exhibit 2, the 100 MHz within the 17.7-17.8 GHz band contains more than 800 existing microwave licenses,[51] many of whom likely have already been adversely impacted by DIRECTV' DBS operation when relocated from the 12 GHz band pursuant to the Commission's 1983 Microwave Relocation Order. This high density of microwave usage in the 17.7-17.8 GHz band would appear to preclude sharing between such microwave links and BSS home receivers. Quite tellingly, DIRECTV has not attempted to show that BSS home receivers will be able to coexist with these existing microwave networks at 17 GHz . Consequently, it must be presumed that, at most, only the 400 MHz within the

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[49]47 C.F.R. Parts 2, 21, 22, 23, 74, 78, 81, 87, 90 and 94; Spectrum Utilization Policy for the Fixed and Mobile Services in the 947 MHz-40 MHz Band, First Report and Order, 48 Fed.Reg. 50722 (rel. Sept. 30, 1983) ("Microwave Relocation Order").

[50]Id.

[51]In contrast, when the Commission began to consider the reallocation of the 12.2-12.7 GHz band for BSS, there were only 1426 licensed radio links spread out within the entire 500 MHz of the 12.2-12.7 GHz band. Inquiry into the Development of Regulatory Policy in Regard to Direct Broadcast Satellites for the Period Following the 1983 Regional Administrative Radio Conference, 86 FCC 2d 719, 730-31 (1981). Thus, the density of links in the 17.7-17.8 is significantly greater than it was at 12.2-12.7 GHz. The number of microwave licensees continues to grow. While the total number of licenses in this 17.7-17.8 GHz band grew by 9% in the first six months of 1997, local government use grew by 27%. See Spectrum Frequency Database, PerCom Corp., Bemus Point, NY.

17.3-17.7 MHz band could be employed as a BSS downlink in the United States, and that the 100 MHz from the 17.7-17.8 GHz band will continue to be used for point-to-point microwave service.

D. DIRECTV Fails to Provide Any Analysis In Support of Its 4.5 Degree Spacing Proposal

DIRECTV has suggested that 4.5 degree spacing should be adopted for the new allocation, yet provides no technical analysis to support its proposal.[52] Orbital spacing decisions have a substantial impact on both feeder link and BSS receiver designs, and thus on the technical and economic viability of the service. DIRECTV's failure to provide any analysis whatsoever of its orbital spacing proposal renders this proposal untenable.[53]

IV. THE FULL 24.75-25.25 GHZ BAND IS NOT NEEDED FOR BSS FEEDER LINKS

As shown above, the proposal to allocate 24.75-25.25 GHz for feeder links would be contrary to the public interest because the 25.05-25.25 GHz portion of that band is allocated to the DEMS service and, as DIRECTV concedes, BSS feeder link earth stations would cause harmful interference into DEMS nodal station receivers. Nevertheless, there are a number of ways that BSS feeder links could be deployed without using the spectrum allocated for DEMS. These include reverse band working at 12 GHz; frequency reuse of less spectrum at 24 GHz through the use of a combination of CONUS and spot beams; more

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[52]If existing 12 GHz BSS receiver antennas have a half-power beamwidth of 1.7 degrees, then even closer spacing should be feasible.

[53]Such an omission is particularly glaring in light of DIRECTV's failure to explain why reducing spacing in its existing BSS band could not alleviate its alleged spectrum scarcity. See supra pp. 5, 7, and 15-17.

efficient use of less spectrum through advanced modulation techniques; or the use of spectrum adjacent to 24.75 GHz. DIRECTV's Petition fails to address any of these alternatives.

A. Reverse Band Working at 12 GHz

To the extent that reverse band working for BSS is feasible, as DIRECTV contends, it should be implemented in the 12.2-12.7 GHz band, instead of 24 GHz, for feeder links to correspond with any new 17 GHz BSS downlinks.[54] As noted above, at 17 GHz there would be areas around feeder link stations where BSS receivers would receive interference. Similarly, there would be areas around 12 GHz feeder link stations where BSS receivers would receive interference. Consequently, since DIRECTV posits that it is acceptable at 17 GHz to implement reverse band working, it should be no more difficult to find sites for 12 GHz feeder links than it would be to find sites for 17 GHz feeder links.[55]

B. Frequency Reuse

Frequency reuse by means of spot beam antennas is now commonly employed on international satellites and has been widely proposed for use with new Ka-band GSO FSS systems. This approach can be applied to BSS feeder links to decrease spectrum needs. For example, feeder link frequencies can be reused by employing two separate feeder link receive antennas on the satellite. In this case, only 250 MHz of feeder link spectrum is needed to

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[54]DIRECTV therefore would both uplink and downlink at 12 GHz and uplink and downlink at 17 GHz.

[55]In addition, it likely would be easier to implement reverse band working at 12 GHz than at 17 GHz because of reduced rain attenuation at 12 GHz. Because of lower rain attenuation, feeder links can operate at reduced power levels, which in turn can result in less interference to BSS receivers.